

BIOGRAPHICAL SKETCH

Provide the following information for the key personnel in the order listed for Form Page 2.

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NAME	POSITION TITLE		
Gary S. Firestein, M.D.	Professor of Medicine and Chief, Division of Rheumatology, Allergy and Immunology		
EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing. Include postdoctoral training.)			
INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
Harvard College, Cambridge, Massachusetts Johns Hopkins Univ. School of Medicine, Baltimore, Maryland	A.B. M.D.		Chemistry Medicine

RESEARCH AND PROFESSIONAL EXPERIENCE: Concluding with present position, list, in chronological order, previous employment, experience, and honors. Include present membership on any Federal Government public advisory committee. List, in chronological order, the titles, all authors, and complete references to all publications during the past three years and to representative earlier publications pertinent to this application. If the list of publications in the last three years exceeds two pages, select the most pertinent publications. **DO NOT EXCEED TWO PAGES.**

A. PROFESSIONAL EXPERIENCE:

1980 - 1983 Resident in Medicine, UCLA Medical Center
1983 - 1986 Fellow, Rheumatology Division, University of California, San Diego
1986 - 1988 Fellow, Molecular Biology, La Jolla Cancer Research Institute
1988 - 1992 Assistant Professor of Medicine In Residence, University of Calif., San Diego
1992 - 1996 Director and Senior Director, Immunology, Gensia, Inc.
1996 - 1997 Associate Professor of Medicine, University of California, San Diego
1997 - present Professor of Medicine, University of California, San Diego
1998 - present Chief, Division of Rheumatology, Allergy, & Immunology, University of California, San Diego
1999 - present Executive Director, UCSD Center for Innovative Therapy, La Jolla, CA
2000 - present Deputy Editor, Arthritis and Rheumatism
2000 - present Member, FDA Arthritis Advisory Panel, Washington, D.C.
2001 - present Chairman, FDA Advisory Panel, Washington, D.C.

AWARDS AND HONORS:

1986 Western Regional Rheumatology Fellow Award
1991 Henry Christian Award for Excellence in Research, ACR
1993 Hoffmann LaRoche Visiting Professor, Duke University
1995 Visiting Professor, University of Tennessee
1996 Elected to American Society for Clinical Investigation
1996 Visiting Professor, University of Michigan
1997 Charles Gould Easton Visiting Professor, University of Toronto
1998 Carol-Nachman Prize for Rheumatology
1999 John and Margaret Cochrane Visiting Professor, University of Alabama, Birmingham
2000 Visiting Professor, The Johns Hopkins University School of Medicine
2000 Ruitinga van Swieten Visiting Professor, University of Amsterdam
2002 Elected to Association of American Physicians

B. RELEVANT PUBLICATIONS (selected from 154 manuscripts, chapters and books):

1. Firestein, GS, D Boyle, C Yu, MM Paine, TD Whisenand, NJ Zvaifler, and WP Arend. Synovial interleukin -1 receptor antagonist and interleukin-1 balance in rheumatoid arthritis. Arthritis Rheum 37:644-652, 1994.
2. Zvaifler, NJ, and GS Firestein. Pannus and pannocytes: Alternative models of joint destruction in rheumatoid arthritis. Arthritis Rheum 37:783-789, 1994.

1. Zvaifler, NJ, D Boyle and GS Firestein. Early synovitis - Synoviocytes and mononuclear cells. *Seminars Arthritis Rheum* 23 (Suppl 2):11-16, 1994.
2. Firestein, GS, M Yeo, and NJ Zvaifler. Apoptosis in RA synovium. *J Clin Invest* 96:1631-1638, 1995.
3. Rosegren, S, G Bong, and GS Firestein. Anti-inflammatory effects of an adenosine kinase inhibitor: Decreased neutrophil accumulation and vascular leakage. *J Immunol* 154:5444-5451, 1995.
4. Boyle, DL, RG Sajjadi, and GS Firestein. Adenosine receptor stimulation inhibits synoviocyte collagenase gene expression. *Arthritis Rheum* 39:923-930, 1996.
5. Sajjadi, FG, K Takabayashi, A Foster, R Domingo and GS Firestein. Inhibition of TNF-alpha gene expression by adenosine: The role of A3 adenosine receptors. *J Immunol* 156:3435-3442, 1996.
6. Firestein, GS, K Nguyen, K Aupperle, M Yeo, DL Boyle, and NJ Zvaifler. Apoptosis in rheumatoid arthritis: p53 overexpression in rheumatoid arthritis synovium. *Amer J Pathol* 149:2143-2151, 1996.
7. Bong, GW, S Rosengren, and GS Firestein. Spinal cord adenosine receptor stimulation in rats inhibits peripheral neutrophil accumulation: The role of N-methyl-D-aspartate receptors. *J Clin Invest* 98:2779-2785, 1996.
8. Zvaifler, NJ, V Tsai, J von Kempis, S Alsalameh, GS Firestein, and M Lotz. Pannocytes: Distinctive cells found in articular cartilage erosions from the joints of patients with rheumatoid arthritis. *Amer J Pathol* 150:1125-1137, 1997.
9. Firestein GS, F Echeverri, M Yeo, NJ Zvaifler, and DR Green. Somatic mutations in the p53 tumor suppressor gene in rheumatoid arthritis synovium. *Proc Natl Acad Sci USA* 94: 10895-10900, 1997.
10. Muller-Ladner, U, M Ellices, JB Kriegsmann, D Strahl, RE Gay, GS Firestein, and S Gay. Expression of the alternatively spliced CS-1 fibronectin isoform and its counter-receptor VLA-4 in rheumatoid arthritis synovium. *J Rheumatol* 24:1873-1880, 1997.
11. Boyle DL, Z Han, J Rutter, CE Brinckerhoff, and GS Firestein. Post-transcriptional regulation of collagenase gene expression in synoviocytes by adenosine receptor stimulation. *Arthritis Rheum* 40:1772-1779, 1997.
12. Firestein GS, and NJ Zvaifler. Anticytokine therapy in RA. *New Engl J Med* 337:195-197, 1997.
13. Aupperle K, DL Boyle, M Hendrix, NJ Zvaifler, M Barbosa and GS Firestein. Regulation of synoviocyte proliferation, apoptosis, and invasiveness by the p53 tumor suppressor gene. *Amer J Pathol* 152:1091-1098, 1998.
14. Nguyen K, DL Boyle, J McCormack, S Chada, DJ Jolly, and GS Firestein. Direct synovial gene transfer with retroviral vectors in rat adjuvant arthritis. *J Rheumatol* 25:118-125, 1998.
15. Han Z, DL Boyle, A Manning, and GS Firestein. AP-1 and NF-kB regulation in rheumatoid arthritis and murine collagen-induced arthritis. *Autoimmunity* 28:197-208, 1998.
16. Firestein GS. Starving the synovium: angiogenesis and inflammation in RA. *J Clin Invest* 102:609-21, 1999.
17. Tak PP, TJM Smeets, DL Boyle, MC Kraan, Y Shi, S Zhuang NJ Zvaifler, FC Breedveld, and GS Firestein. P53 overexpression in synovial tissue from patients with early and chronic rheumatoid arthritis compared with patients with reactive arthritis and osteoarthritis. *Arthritis Rheum* 42:948-953, 1999.
18. Han Z, DL Boyle, Y Shi, DR Green and GS Firestein. Dominant negative p53 mutations in rheumatoid arthritis. *Arthritis Rheum* 42:1088-1092, 1999.
19. Aupperle KR, B Bennett, DL Boyle, PP Tak, AM Manning and GS Firestein. Regulation of NF-kB by Ikb kinase in fibroblast-like synoviocytes. *J Immunol* 163:427-33, 1999.
20. Han Z, DL Boyle, KR Aupperle, B Bennett, AM Manning, and GS Firestein. Jun N-terminal kinase activation in rheumatoid arthritis synoviocytes. *J Pharm Exp Ther* 291:124-130, 1999.
21. Boyle DL, KHY Nguyen, S Zhaung, Y Shi, JE McCormack, S Chada, and GS Firestein. Intra-articular IL-4 gene therapy in arthritis: anti-inflammatory effects and enhanced Th2 activity. *Gene Ther* 6:1911-1918, 1999.
22. Tak, PP, MS Klapwijk, SFM Broersen, DA van de Geest, MJ Overbeek, PK Robbins, and GS Firestein. Apoptosis and p53 expression in rat adjuvant arthritis. *Arthritis Research*, 2:229-235, 2000.
23. Gerlag DM, L Ransone, M Panki, Z Han, PP Tak, AM Manning, and GS Firestein. Effect of a T cell specific NF-kB inhibitor on in vitro cytokine production and collagen-induced arthritis in mice. *J Immunol* 165:1652-1658, 2000.
24. Pap T, WH van der Laan, KR Aupperle, RE Gay, JH Verheijen, GS Firestein, S Gay, and M Neidhart. Modulation of fibroblast-mediated cartilage degradation by articular chondrocytes in RA. *Arthritis Rheum* 43:2531-7, 2000.
25. Aupperle KR, BL Bennett, Z Han, DL Boyle, AM Manning and GS Firestein. NF-kB regulation by Ikb kinase-2 in fibroblast-like synoviocytes. *J Immunol* 166:2705-2711, 2001.
26. Tak PP, DM Gerlag, KR Aupperle, DA van de Geest, M Overbeek, BL Bennett, DL Boyle, AM Manning and GS Firestein. Inhibitor of nuclear factor kappaB kinase beta is a key regulator of synovial inflammation. *Arthritis Rheum* 44:1987-1907, 2001.
27. Han Z, DL Boyle, L Chang, B Bennett, M Karin, L Yang, AM Manning and GS Firestein. c-Jun N-terminal kinase is required for metalloproteinase expression and joint destruction in inflammatory arthritis. *J Clin Invest* 108:73-81, 2001.
28. Yamanishi Y, DL Boyle M Clark, RA Maki, MD Tortorella, EC Arner and GS Firestein. Expression and regulation of aggrecanase in arthritis: the role of TGF-beta. *J Immunol* 168:1405-1412, 2002.
29. Yamanishi Y, DL Boyle, MJ Pinkoski, A Mahboubi, T Lin, Z Han, NJ Zvaifler, DR Green and GS Firestein. Regulation of joint destruction and inflammation by p53 in collagen-induced arthritis. *Am J Pathol* 160:123-130, 2002.
30. Yamanishi Y, DL Boyle, S Rosengren, DR Green, NJ Zvaifler, GS Firestein. Regional analysis of p53 mutations in rheumatoid arthritis synovium. *Proc Natl Acad Sci USA*, 99: 10025-10030, 2002.